

Application No. 10/664,776
Amendment dated May 15, 2006
Reply to Office Action of November 14, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-7 (cancelled).

8. (new) A plate system adapted for application to an anterior human spine and for contacting at least a portion of anterior aspects of at least two vertebral bodies adjacent a disc space, said plate system comprising:

a plate having a mid-longitudinal axis and a length sufficient to span the disc space and overlap portions of the at least two adjacent vertebral bodies, said plate having a lower surface for placement against the vertebral bodies and an upper surface opposite said lower surface;

at least two bone screw receiving holes extending through said plate from said upper surface through said lower surface;

a plurality of bone screws, each bone screw insertable in one of said bone screw receiving holes, each bone screw having a head, a tip opposite said head, and a threaded shaft, said head having a maximum height parallel to the central longitudinal axis of said bone screw and a maximum diameter transverse to the central longitudinal axis of said bone screw, the maximum height of said head being less than one-half the maximum diameter of said head; and

a locking element having a lower-facing surface adapted to cover a portion of said head of only a single one of said bone screws to prevent the inadvertent backing out of said single bone screw from one of said bone screw receiving holes, said locking element having an outer diameter, a central longitudinal axis, and an opening through said locking element along the central longitudinal axis.

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9. (new) The plate system of claim 8, wherein said opening has a maximum inner diameter that is greater than one-half the outer diameter of said locking element, the maximum diameter of said opening of said locking element being adapted to receive a portion of said head of said single bone screw.
10. (new) The plate system of claim 8, wherein said locking element has a top surface that is at least in part arcuate in a plane parallel with the central longitudinal axis of said locking element.
11. (new) The plate system of claim 10, wherein said top surface of said locking element projects from said upper surface of said plate when fully engaged thereto.
12. (new) The plate system of claim 8, wherein at least one of said bone screw receiving holes is configured to retain the entire head of said single bone screw above said lower surface of said plate.
13. (new) The plate system of claim 8, wherein the central longitudinal axis of said locking element is coaxial with the central longitudinal axis of said single bone screw.
14. (new) The plate system of claim 8, wherein said head of said single bone screw includes a tool-engaging recess having a maximum dimension transverse to the central longitudinal axis of said single bone screw, the maximum transverse dimension of said tool-engaging recess spanning said opening of said locking element when said single bone screw is inserted into one of said bone screw receiving holes and said locking element covers a portion of said single bone screw.
15. (new) The plate system of claim 8, wherein said locking element fixes the position of the central longitudinal axis of said single bone screw relative to said plate.
16. (new) The plate system of claim 8, wherein said head of said single bone screw includes an outer side surface with a flat portion along at least a portion of the

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height of said single bone screw.

17. (new) The plate system of claim 8, wherein said locking element has a top portion with said lower-facing surface and an intermediate portion having a side surface oriented toward said head of said bone screw when said bone screw is inserted in said bone screw receiving hole, said bottom of said locking element having an upper surface oriented toward said head of said single bone screw when said single bone screw is inserted in one of said bone screw receiving holes, said lower surface of said top portion and said upper surface of said bottom each having a portion in a vertical plane parallel to the central longitudinal axis of said locking element.
18. (new) The plate system of claim 8, wherein said locking element is preinstalled.
19. (new) The plate system of claim 8, wherein said locking element is adapted to engage said plate to lock the single bone screw without threading into said plate.
20. (new) The plate system of claim 8, wherein said locking element and said plate are made of the same material.
21. (new) The plate system of claim 8, in combination with a bone graft.
22. (new) The plate system of claim 8, in combination with a bone growth promoting material.
23. (new) The plate system of claim 22, wherein said bone growth promoting material includes at least one of bone morphogenetic protein, hydroxyapatite, and hydroxyapatite tricalcium phosphate.
24. (new) A method for connecting at least two vertebral bodies adjacent a disc space from an anterior aspect of the vertebral bodies, said method comprising the steps of:
providing a plate having a length sufficient to contact the two adjacent vertebral bodies across the disc space and having a plurality of bone screw receiving holes;

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inserting at least in part into the plate a locking element adapted to lock only a single bone screw to the plate, the locking element having a central longitudinal axis;

positioning the plate against at least a portion of the anterior aspect of the vertebral bodies to align at least one of the bone screw receiving holes with a respective one of the adjacent vertebral bodies; and

inserting a bone screw having a head having an upper facing surface into a position in one of the bone screw receiving holes that permits the locking element to cover a portion the upper facing surface of the head of the bone screw after the bone screw has been inserted into the plate, the step of inserting the bone screw being performed after the step of inserting the locking element.

25. (new) The method of claim 24, further comprising the step of locking the bone screw to the plate with the locking element.
26. (new) The method of claim 25, wherein the locking element has a bottom with a cross section transverse to the central longitudinal axis of the locking element, the step of locking being performed while maintaining a constant cross section at the bottom of the locking element.
27. (new) The method of claim 24, wherein the step of inserting the locking element at least in part into the plate is performed without threading the locking element into the plate.
28. (new) The method of claim 24, further comprising combining the plate with a bone growth promoting material.
29. (new) The method of claim 28, wherein the bone growth promoting material includes at least one of bone morphogenetic protein, hydroxyapatite, and hydroxyapatite tricalcium phosphate.